Feeding Premature Infants

Recent Modifications in the In-Dwelling Nasogastric Tube Method

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• In a two-year period some 600 premature infants were fed through an in-dwelling plastic nasogastric catheter. The results suggest that this method is practical and less fatiguing than gavage or dropper feeding. To increase the ease and safety of this procedure certain modifications in the technique of taping the catheter and of preparing its leading end are suggested.

USE OF polyethylene nasogastric tubes for the feeding of premature infants has now had a two-year clinical trial. The method has been used in more than 600 cases. Originally developed to eliminate the factor of feeding fatigue in weak premature infants, it has proved a practical alternative to the more exhausting gavage and dropper methods. Often a premature infant who becomes cyanotic when attempt is made to pass a gavage tube will sleep throughout the feeding period when a nasogastric tube is in place, and can be fed, without distress, at any interval desired by the physician.

Extensive use of this method by several pediatric centers* has allowed comparison with other feeding procedures and has led to certain important modifications in technique. Answers to some of the problems that arose concomitantly with widespread use of the plastic catheter have been provided. More detailed information is now available on the relatively minor questions of the best method of taping the tube in place and the length of time the tube should remain in one nostril, as well as on the major questions of esophageal irritation, gastric perforation, and the possibilities of tracheal instead of esophageal intubation.

The indications for the in-dwelling nasogastric tube remain as originally described.[3] It is designed only for those infants who are too weak to suck well, and those who become cyanotic with gavage or dropper feedings. The tube may be inserted with a minimum of disturbance to these babies, and once in place it may remain for as long as twelve days before it is necessary to change it to the opposite nostril, and in the esophagus for as long as 65 days. Usually it is not necessary to feed by this means for so long a time. As soon as the baby begins to gain weight and strength, frequent attempts should be made to start nipple feedings, and once the baby is able to take adequate amounts in this fashion the tube should be withdrawn.

The method of taping the tube in place has occasionally caused difficulty. A premature infant who is too weak to suck is often surprisingly adept at prying loose any exposed portions of the tube. As was suggested in the original communication,[3] a "generous amount" of adhesive tape should be used. To avoid sharp turns in the tube, it should be held in place in a sweeping curve from the nostril to the opposite cheek, and thence to the temporal region (Figure 1). Standard adhesive tape applied in liberal amounts usually is only temporarily and mildly irritating to the skin of the baby. Owing to the high humidity maintained in the units in which most premature infants are kept, plastic tape seldom serves the purpose.

Now and then a baby dislodges a tube despite firm taping. Several times in the author's experience the tube was swallowed and appeared in the feces some few days later. As a precaution, therefore, an overhand knot should be tied in the exposed end of the tube, and the knot then taped to the baby's forehead (Figure 2).

The factor of esophageal irritation is difficult to evaluate. Results of observations thus far suggest that it is not a prominent feature. In no instance has

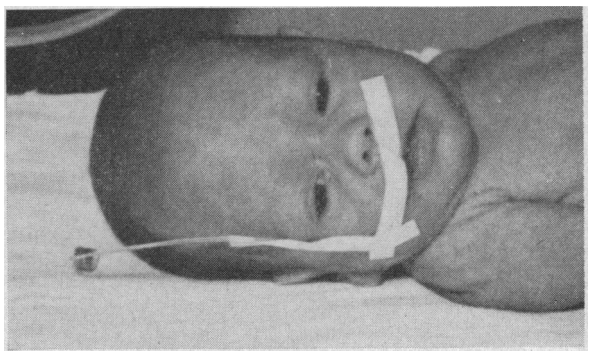

Figure 1

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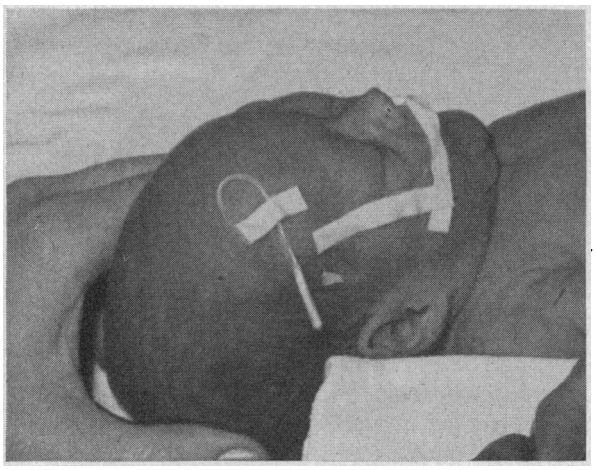

Figure 2

death been attributed to ulceration, and the incidence of ulceration associated with this method of feeding apparently is not inordinately high. (Gruenwald and Marsh[2] reported ulceration in 16 2/3 per cent of 310 infants who had not had esophageal intubation.) Although there is no direct evidence that the incidence of ulceration is related to the duration of intubation, certainly the shortest possible period is to be desired.

Although gastric perforation is a rare concomitant of feeding by the method under discussion, it is an extremely important consideration. Apparently there are at least two pertinent factors: the size of the tube, and the method of preparing the leading end. Use of a tube with an internal diameter larger than .07 cm. (external diameter equivalent to No. 3 French catheter) increases the likelihood of gastric perforation. Two instances of the occurrence of perforation under these conditions have been reported. It is not necessary to use the larger tubing, since most milk preparations will pass fairly easily through the No. 22 or No. 23 needle that is inserted into the tubing. Originally it was suggested that the end of the tube be cut square and smoothed with fine emery paper; but even thus prepared the leading end can still be hazardous, and to reduce the danger the tip may be sealed with a coating of paraffin and then an elliptical side opening made in the tubing just above the paraffin plug. Cutter[1] recently suggested a valuable modification: If, instead of paraffin, a small bubble of Duco liquid cement is allowed to dry on the tip, a perfectly smooth and durable leading edge that is non-irritating to the gastric mucosa is formed.

Although there is always the dangerous possibility the tube may be introduced into the trachea rather than into the esophagus, thus far there has been no problem in this regard. Often an infant's first reaction to the entering tube is an attack of sneezing, and occasionally coughing, but there is little respiratory distress. The sneezing often continues for several minutes, but thereafter the infant appears to have little awareness of the tube. To make sure that the tube is correctly placed, 1 cc. of air should be injected through the tube and the sound of air entering the stomach listened for with a stethoscope over the abdomen. As a final check 0.25 cc. of saline solution should be infused and the infant watched for signs of respiratory distress.

This method of feeding is not entirely without hazard, and despite its apparent advantages over older methods it cannot be used as a substitute for skilled nursing care, nor simply as a convenience to the staff.

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REFERENCES

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3. Royce, S., Tepper, C., Watson, W., and Day, R.: Indwelling polyethylene nasogastric tube for feeding premature infants, Pediatrics, 8:79, 1951.